

IN THE CLAIMS:

MARKED-UP VERSION OF THE AMENDED CLAIMS:

1. (currently amended) A diagnostic system for a modular fieldbus board carrying a number of fieldbuses connected to a bulk power supply, comprising a monitoring transceiver ~~means~~adapted means connected in use to ~~[[one]]~~ two or more of the number of fieldbuses ~~by means of~~ in which each connection to a fieldbus comprises two or more ~~common mode and/or differential mode~~ signal injection and/or signal detection points, which points are collectively adapted to inject and/or detect both common mode and differential mode signals, and which points are ~~dispersed~~ located between the bulk power supply and ~~[[the]]~~ a fieldbus ~~[[trunk]]~~ trunk part of the fieldbus, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points, and in which the monitoring transceiver means is provided with a first digital and/or analog interface separate from the fieldbus trunk, and adapted to transmit diagnostic data detected by the monitoring transceiver means directly to an associated digital or analog device .

2. (previously presented) A diagnostic system as claimed in Claim 1 in which the fieldbus physical layer characteristics comprise one or more of: over/under termination, noise/ripple level, signal level, signal bias, signal jitter,

signal ringing, signal distortion, signal attenuation, cross talk, unbalance, and earth leakage.

3. (previously presented) A diagnostic system as claimed in Claim 1 in which the monitoring transceiver means also detects one or more characteristics of hardware carried on the modular fieldbus board by means of one or more of said points.

4. (previously presented) A diagnostic system as claimed in Claim 3 in which the one or more characteristics of hardware comprise one or more of: voltage, short circuit, hardware module failure, quiescent current, and rate of charge.

5. (previously presented) A diagnostic system as claimed in Claim 4 in which the monitoring transceiver means is adapted to gather received data and produce one or more of: Fourier analysis, trending analysis, and data logging.

6. (currently amended) A diagnostic system as claimed in Claim 1 in which the monitoring transceiver means is adapted to provide an alarm in the event that received data indicates one or more of pre-determined failures [[or]] has occurred on any of the [[one]] two or more fieldbuses, and in which the first digital

and/or analog interface is adapted to transmit said alarm directly to an associated digital or analog device.

7. (currently amended) A diagnostic system as claimed in Claim 1 in which the ~~monitoring transceiver means is provided with a first digital and/or an analogue~~ analog interface, ~~such that diagnostic data detected and/or alarms created by the monitoring transceiver means in use are transmitted to a digital or analogue device operated by a user, and such that~~ is adapted to receive operating commands are sent in use from the user operated an associated digital or analogue analog device ~~to operate the monitoring transceiver means.~~

8. (currently amended) A diagnostic system as claimed in Claim 6 [[7]] in which the monitoring transceiver means is provided with a second digital and/or an analogue analog interface, such that diagnostic data detected and/or ~~alarms~~ alarm created by the monitoring transceiver means [[in]] during use are transmitted to other associated diagnostic systems.

9. (currently amended) A diagnostic system as claimed in Claim 6 [[1]] in which the monitoring transceiver means is provided with visual means adapted to display diagnostic data detected and/or ~~alarms~~ alarm created.

10. (canceled)

11. (previously presented) A diagnostic system as claimed in Claim 1 in which the monitoring transceiver means is connected to the bulk power supply.

12. (currently amended) A diagnostic system as claimed in Claim 1 in which one or more of the two or more ~~common mode and/or differential mode~~ signal injection and/or signal detection points are disposed within hardware carried on the board.

13. (currently amended) A modular fieldbus board comprising a number of fieldbuses connected to a bulk power supply, and a diagnostic system comprising a monitoring transceiver ~~meanseconnected~~ means connected to ~~[[one]]~~ two or more of the number of fieldbuses by means of two or more ~~common mode and/or differential mode~~ signal injection and/or signal detection points, ~~[[which]]~~ wherein the points are adapted to inject and/or detect both common mode and differential mode signals, and wherein the points are dispersed interposed between the bulk power supply and the fieldbus trunk, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points.

14. (previously presented) A modular fieldbus board as claimed in Claim 13 in which each of the one or more fieldbuses comprise a connection to the bulk power supply, a power supply converter, a power supply conditioner and a fieldbus trunk.

15. (currently amended) A modular fieldbus board as claimed in Claim 14 in which on ~~[[an]]~~ each of the one or more fieldbuses, a first common mode signal injection and/or signal detection point is disposed between the bulk power supply and the power supply converter, ~~in which~~ wherein a second common mode signal injection and/or signal detection point is disposed between the power supply converter and the power supply conditioner, in

which a third ~~[[a]]~~ common mode signal injection and/or signal- detection point is the power supply conditioner and the field bus trunk, and a differential mode signal injection and/or signal detection point is disposed between the third common mode signal injection and/or signal detection point and the fieldbus trunk.

16. (previously presented) A modular fieldbus board as claimed in Claim 15 in which a fourth common mode signal injection and/or signal detection point is disposed within the power supply converter, and in which a fifth common mode

signal injection and/or signal detection point is disposed within the power supply conditioner.

17. (new) A diagnostics system as claimed in Claim 1 in which each of the two or more fieldbuses comprises a connection to the bulk power supply, a power supply converter and a power supply conditioner.

18. (new) A diagnostic system as claimed in Claim 17 wherein, on each of the two or more fieldbuses,
a first common mode signal injection and/or signal detection point is disposed between the connection to the bulk power supply and the power supply converter, wherein a second common mode signal injection and/or signal detection point is disposed between the power supply converter and the power supply conditioner, wherein a third a common mode signal injection and/or signal detection point is disposed between the power supply conditioner and the fieldbus trunk, and wherein a differential mode signal injection and/or signal detection point is disposed between the third common mode signal injection and/or signal detection point and the fieldbus trunk.

19. (new) A diagnostic system as claimed in Claim 18 In

which a fourth

common mode signal injection and/or signal detection point is

disposed within the power supply converter, and in which a fifth

common mode signal injection and/or signal detection point is

disposed within the power supply conditioner.

20. (new) A modular fieldbus board comprising

a bulk power supply;

a plurality of fieldbuses including a fieldbus trunk and connected to the bulk power supply;

two or more signal injection and/or signal detection points, wherein the points are adapted to inject and/or detect both common mode and differential mode signals, and wherein the points are interposed between the bulk power supply and the fieldbus trunk; and

a diagnostic system comprising monitoring transceiver means connected to two or more of the plurality of fieldbuses by means of two or more signal injection and/or signal detection points, such that the monitoring transceiver means can detect one or more fieldbus physical layer characteristics between two of the two or more of said points.